AN ANALYSIS OF THE PUBLIC WORKS OFFICER AS A RESOURCE MANAGER

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THESIS

AN ANALYSIS OF THE PUBLIC WORKS OFFICER AS A RESOURCE MANAGER

by

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The Public Works Officer (PWO) in the Navy faces a personal dilemma in his resource allocation decision process. The PWO must satisfy both the operationally oriented effectiveness criteria of his Commanding Officer (CO) and the economically oriented efficiency goals of the public works management system designed and monitored by the Naval Facilities Engineering Command (NAVFAC). This thesis analyzes the PWO's organizational environment, enumerates the management functions that must

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An Analysis of The Public Works Officer as a Resource Manager

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ABSTRACT

The Public Works Officer (PWO) in the Navy faces a personal dilemma in his resource allocation decision process. The PWO must satisfy both the operationally oriented effectiveness criteria of his Commanding Officer (CO) and the economically oriented efficiency goals of the public works management system designed and monitored by the Naval Facilities Engineering Command (NAVFAC). This thesis analyzes the PWO's organizational environment, enumerates the management functions that must be performed and highlights the efficiency/effectiveness dichotomy faced in management decision actions.

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I. INTRODUCTION

Activity in public works and public utilities is big business for the Navy and the Civil Engineer Corps (CEC) in particular. Approximately 40% of all active CEC officers are directly involved in public works operations [Ref. 30]. Additionally, others on various staffs or attached to the Naval Facilities Engineering Command (NAVFAC) and its Engineering Field Divisions (EFD) are also involved in advisory or policy setting roles. From a dollar standpoint in fiscal year 1968, $154,000,000 of the $4.6 billion Operations and Maintenance - Navy (O&MN) appropriation was labeled by Congress "to be available only for maintenance of real property facilities" [Ref. 2, p. 62], while in fiscal year 1972, $258.4 million was spent on the Navy's utilities systems [Ref. 43]. These figures give some idea of the magnitude of public works operations.

The spectrum of public works activity is large and requires considerable management direction by the individual Naval station's key public works official, the Public Works Officer (PWO). The PWO is tasked with managing such diverse elements as real estate, electric generating plants, family quarters and mobile cranes. To assist him in his management decisions, the Navy has developed a comprehensive series of public works management reports and procedures. The purpose of this thesis is to critically analyze the role of the PWO as a resource allocation decision maker in

light of the organizational and behavioral constraints acting upon him. Specifically the systems which he must manage and the restrictions they place on the range of his decision making process will be discussed. In addition, the PWO's personal dilemma, arising from the conflicts between the methods used to measure operational goals and the measurements concerned with engineered efficiency will be developed.

Initially the environment, both organizationally and with respect to regulations, within which the PWO functions is discussed. Next is detailed an analysis of what support the activity comptroller and the accounting systems the comptroller manages can and should provide to the PWO. An analysis of the major public works management subsystems that the PWO must oversee is presented and, finally, and by far the most significant, an evaluation of the PWO as a manager is provided. The primary functions of a manager (planning, organizing and controlling) as recognized by most authors of management theory [Ref. 9, p. viii] are used as the vehicle to analyze the PWO's role as a manager and the forces that influence his decisions.

The thesis is primarily expository. A myriad of instructions, regulations, manuals and management theories are aimed at influencing some portion of public works department (PWD) operations. The authors have attempted to provide in one publication a summary of the major documents concerning Navy public works management and operation so that the reader can more easily fathom the diverse forces acting on the PWD and its leader, the PWO.

Research has been confined to published documents concerning public works. Research was conducted to emphasize what existing public works documents actually said, not some other "expert's" opinion of what they said. It is logically much easier to ask someone close at hand for help than to spend the time personally researching. However this thesis can provide a useful summary to PWO's in rapidly developing a grasp of the features of their task and the measurement tools available.

The thrust of the thesis is toward the PWO, not his subordinates. Thus, many details of concern to the assistant public works officer (APWO), shops engineer and others of lower level management have been excluded. As will be shown in Chapter V, the PWO is the overall manager of public works and, by sound management principle, must delegate day to day operations to his subordinates [Ref. 38, p. 4]. At the same time the PWO should be generally familiar with those tasks his subordinates are accomplishing or should be accomplishing. For this reason a general description of the major public works operating and support systems has been included.

II. BACKGROUND

A. OVERVIEW

This chapter provides a general overview of the organizational environment in which the PWO functions and discusses the significant constraints imposed on him by the overall Navy organization. Specifically, the chapter demonstrates that the PWO, unlike his

contemporaries in private industry, must execute his management decision making process within the framework of an inflexible, tradition-bound organization.

B. THE DEPARTMENT OF THE NAVY

1. Origin

The initial beginnings of naval affairs of this country can be traced back to the days of the American Revolution. On 15 October 1775, Congress passed legislation which formed a committee to purchase and arm two ships, thereby creating what has been termed the Continental Navy. Approximately fourteen years later on 7 August 1789, the First Congress assigned the responsibility for the conduct of naval affairs to the then War Department. This responsibility was later transferred on 30 April 1798 when Congress established a separate Navy Department with the Secretary of the Navy (SECNAV) as its chief official [Ref. 8, p. 1].

In 1949, the Congress amended the fundamental law governing the Department of the Navy. This amendment established a new organization, the Department of Defense (DOD), as the executive department for national defense (formerly the Departments of Army, Navy and Air Force had executive department status) and relegated the Department of the Navy to a military department within the DOD without executive status. This departmental organization remains the same today.

2. Legitimacy

The legal foundation for the forming of and continued existence of a naval military establishment in this country is provided for in the Constitution of the United States. Article I, Clause Thirteen and Fourteen give to Congress the power to provide and maintain a Navy and to make rules for government of naval forces [Ref. 36, p. 113]. With this power, Congress has passed legislation and many statutes for the government of the military establishment.

Within the Department of the Navy, two basic publications form the backbone for the conduct of navy business; Navy Regulations and General Orders. Title 10 U. S. Code, Section 6011 provides the authority to the SECNAV to publish these documents and they govern all persons within the Department of the Navy. Contested in court, these regulations have been judged by the Supreme Court to have the sanction of law [Ref. 36, p. 114].

3. Principal Parts (Composition)

Almost since the inception of the Federal Government, the Department of the Navy has both functionally and organizationally been divided into three broad categories: the Operating Forces, the Navy Department, and the Shore Establishment [Ref. 8, p. 1].

4. Objectives

The fundamental objectives of the Department of the Navy are a direct function of and were developed to perform military missions as directed by the President or Secretary of Defense.

Specifically, these objectives are as follows:

a. To organize, train, equip, prepare and maintain the readiness of Navy and Marine Corps forces and,

b. To support Navy and Marine Corps forces [Ref. 8, p. 1].

C. NAVAL FACILITIES ENGINEERING COMMAND

1. General Duties

The Naval Facilities Engineering Command (NAVFAC) is one of five component systems commands of the Naval Material Command. Its general duty is to provide support to the Operating Forces of the Navy and other naval components and organizations in matters which relate to shore facilities and engineering material and equipment [Ref. 28, p. 2].

2. Responsibilities

The responsibilities assigned to NAVFAC by higher authority cover a wide range of functions and are generally oriented towards material support, technical support to commands, and advice and assistance of an engineering nature. Also included are responsibilities for managing, sponsoring or administering various naval programs.

3. Engineering Field Divisions (EFD)

In order to better accomplish its assigned responsibilities, NAVFAC utilizes six field activities designated as Engineering Field Divisions. These activities have responsibility for the accomplishment of NAVFAC objectives and programs related to naval shore activities within the EFD's wide geographical areas of responsibility.

The standard mission of an EFD includes, but is not limited to, the accomplishment of planning, design and construction of public works and public utilities; disposal of Navy real estate; advice and assistance in the administration of facilities management resources; direction and administration of the assignment, replacement, disposal, maintenance and utilization of transportation, weight handling and construction equipment and collateral support equipment [Ref. 42].

Because of the nature of the EFD mission, frequent working relationships are generated between the EFD and naval shore activity public works organizations.

D. THE SHORE STATION

1. Mission

The naval shore stations in existence within the United States and throughout the world are components within the Shore Establishment of the Department of the Navy. These stations can be classified into many different types and perform varied assigned functions and missions in support of the Operating Forces. Examples include Naval Air Stations to support the Naval Air Force, Naval Stations to support the fleets, shipyards to support repair and overhaul of ships, etc.

The specific missions of each shore station are approved by SECNAV as proposed and developed by the Chief of Naval Operations (CNO).

2. Operations/Organization

The general operations of and the organizations of naval shore activities follow similar lines. Each naval station usually is organized with a Commanding Officer and direct and indirect department heads. The direct department heads act as staff to the Commanding Officer in direct support of the station's mission. Indirect department heads support the direct mission departments. The Public Works Department is an example of one of these indirect departments.

In the day-to-day administration of the shore activity, the Commanding Officer is guided by responsibilities set forth in Navy Regulations. It is this document, which bears the force of law, that provides the latitude in which the Commanding Officer may legally command and provides the legal force of his orders to subordinates.

The department heads in assisting the Commanding Officer, operate under the delegated authority of the Commanding Officer [Ref. 7]. Inherent within this delegated authority is the responsibility for rigid compliance with regulations governing the receipt, accounting, and expenditure of public money and materials, and the implementation of improved management techniques and procedures [Ref. 8, p. 13].

E. PUBLIC WORKS ORGANIZATIONS

1. Mission

There are approximately 329 established public works organizations serving the naval (field) activities of the shore establishment. Even though those organizations are numerous they all perform the same basic mission for the shore establishment. The mission of these organizations encompasses maintenance and operation of facilities and collateral equipment, including utility plants and systems; maintenance and operation of transportation and weight-handling equipment. Public works organizations that are a component of the naval shore station additionally perform design engineering and facility planning functions [Ref. 32, p. 2-7].

2. Types

Currently, there are three distinct types of public works organizations: the Public Works Department (PWD), the Public Works Lead Activity (PWLA), and the Public Works Center (PWC).

The PWD is an organizational component of a naval shore activity and, as such, functions under the direct control of the activity's Commanding Officer to serve that particular activity. The PWLA, on the other hand, is the same in organizational composition, but serves more than one shore activity. Usually, the additional activities served are contiguous to the activity at which the PWLA organization is physically located. Even though the PWLA serves additional customers, it still

remains organizationally assigned and under the authority of one particular Commanding Officer.

The PWC organization varies significantly from that of the PWD/PWLA in number of activities served and organizational relationships. PWC's are an organizational entity unto themselves with their own Commanding Officer. They are established to serve many different activities in those geographical areas which contain a high concentration of naval shore activities. Organizationally, they operate under the authority and direction of NAVFAC.

Although three distinct types of public works organizations are established to serve the shore activity, only the Public Works Department organization will be dealt with as a subject in this thesis.

3. Public Works Department Organization

In order to efficiently and effectively manage the resources necessary in the performance of the Public Works Department's mission, an organization has been developed along functional lines. The department's primary function, the mission, is divided into five subfunctional categories of Management, Family Housing, Engineering, Maintenance Control and Production [Ref. 32, p. 2-7].

The standard PWD organization is composed of six divisions, three of which support the overhead subfunctions of the department and three which support the Production subfunction. Overall department direction is under the Public Works Officer [Ref. 27, p. 10].

The Administrative Division of the PWD performs duties in the Management and Family Housing subfunctional areas with responsibilities for office services, civilian personnel services, management analysis, financial matters and housing operation and maintenance.

The Maintenance Control Division performs in the Maintenance Control subfunctional areas with specific responsibility for planning and estimating, facility inspection, work reception and control.

Responsibilities for facility project programming, engineering and design are accomplished by the Engineering Division.

The three remaining divisions, i.e., Maintenance, Utilities and Transportation Divisions, perform their duties in the Production subfunctional category in the areas implicit in their titles. These divisions are composed of the direct labor personnel of the department.

As would be expected, the size of a PWD varies greatly from one activity to another, dependent on the type and amount of work to be done, the amount of plant to be maintained and the magnitude of utilities and transportation services to be provided. In those PWD's with limited workload in specific areas, a modified PWD organization is usually employed [Ref. 27, p. 11].

One of the ways in which PWD's can be differentiated is by size utilizing the combined number of personnel employed in the Maintenance and Utility Divisions as the criteria of differentiation. Large organizations contain 400 or more personnel,

medium 75 to 400, small 30 to 74 and very small less than 30 [Ref. 32, p. 2-11].

F. FUNDS ACQUISITION/DISTRIBUTION

Financing and funding of the Department of the Navy is through public money which the Congress makes available under its granted authority in Article I of the Constitution. The bulk of revenue comes from individual income taxes, corporation income taxes and excise taxes levied by the government.

The Budgeting and Accounting Act of 1921 requires the President to submit to Congress the annual Federal Budget which is made up of the annual estimates of all government agencies. It is this initial phase which starts the process of funds acquirement for the Department of the Navy. Budget requests are developed by the Department and are reviewed and approved at the Secretary of Defense level and, subsequently, compiled into one defense budget for the President's submission to Congress.

The President's budget submission, as it concerns defense, is broken down into broad programs: Military Personnel, Operations and Maintenance, Procurement, Research and Development, and Military Construction. These broad categories are further subdivided by subtitles and military service. Each program is reviewed and when approved by Congress is passed as an appropriation bill for the President's signature into law.

The fact that the President signs an appropriation bill into law does not mean that money is immediately available to the Navy for expenditure. The bill itself is first sent to the Treasury Department where listings of appropriations and related sums of public money are prepared. These listings are termed "appropriation warrants" and in effect act as checks into the government Treasury from which accounts are established for the Navy. A copy of the appropriation warrant is forwarded through the SECNAV to the Comptroller of the Navy (NAVCOMPT).

On receipt of the appropriation warrant, the amounts available to each headquarters component for obligation are established by the NAVCOMPT and are allocated in writing to the heads of Responsible Administering Offices [Ref. 2, p. 134].

By the use of allotments, operating budgets and project orders, the Major Claimants, which are those responsible for overall fund management, authorize field activities to obligate and expend public monies against appropriations in accordance with approved activity budgets.

III. COMPTROLLER SUPPORT

A. OVERVIEW

This chapter discusses the duties of the Naval Station comptroller as they relate to the PWD, station budgeting, Navy accounting in general, the cost accounting system used to measure PWD performance against the budget, and the real property

inventory system that provides the data base for many facilities related decisions. While not under the control of the PWO, these functions must be accomplished to give the PWO timely information to use in his management decision process.

B. COMPTROLLER RESPONSIBILITY

1. General

The PWO is primarily concerned and interacts with the comptroller in the areas of budgeting and accounting. As the key financial manager at the station, the comptroller provides the support to the PWO that is essential for smooth operation of the PWD. In addition it is the comptroller, not the PWO, who prepares and releases the station's budgetary and accounting reports which include reporting in the public works area. The comptroller's staff may have little or no understanding of the technical details of public works operations. In compiling reports the comptroller department has no intuitive yardstick to use in checking the validity of numbers included in the reports. Thus, the PWO must work with the comptroller to insure that logic prevails over the routine posting of numbers. As the CECOS Manual so profoundly states, "Cultivate Thy Comptroller" [Ref. 32, p. 13-20]. The PWO is in competition with other station managers for the scarce resources available and the comptroller is an essential ally in the PWO's continued funding battles.

2. Budgeting

The primary function of a manager is planning [Ref. 9, Chap. 4]. Although prior planning involves more than fiscal budgeting, the budget is the vehicle by which planning is documented. The budget is a fiscal tool, and as such it falls in the comptroller's domain. While the comptroller does not derive the budget, he co-ordinates its assembly and insures that it satisfies the format requirements of the major claimant to whom it is submitted. The budget must be prepared. How good a planning tool it is depends on how well it is prepared. It is easy to take last year's budget and increment it by some percentage and call that this year's budget, but that is not planning. Budgeting is difficult; it requires thorough analysis and some hard decision making on priorities. The detailed planning that goes into a good budget, however, will be of value to the manager throughout the life of the budget. The CECOS Manual provides an excellent discussion on Navy budget preparation [Ref. 32, Chap. 13].

3. Fiscal Accounting

The NAVCOMPT Manual defines the accounting responsibilities of the comptroller with respect to public works very succinctly:

> As specified in this volume, the comptroller department or fiscal office of the activity will perform appropriation, allotment, cost, and property accounting and report preparation, and also be responsible for technical supervision over all accounting procedures contained in this chapter.
> [Ref. 5, p. 7-3]

The NAVCOMPT Manual further states that the public works cost accounting procedures defined in the manual are, "designed to require a minimum of clerical effort within the Public Works Department which effort should be limited to the generation of basic cost and statistical data." [Ref. 5, p. 7-3] Thus, the PWO is not required, nor expected, to supervise an accounting function; this task is clearly within the domain of the activity comptroller.

Local comptrollers normally keep memorandum accounts and provide feeder information to an activity designated to act as the "official" accountant. This "official" accountant is normally termed the Authorization Accounting Activity (AAA) for both fiscal and property accounting, although as shown in the NAVCOMPT Manual, the AAA may not be responsible for property accounting. Activities dependent on the AAA for service are naturally called dependent activities. The fiscal and property accounting activity for every Naval activity is shown in Vol. 2 of the NAVCOMPT Manual [Ref. 4]. One AAA states the dependent activity's responsibility with respect to record keeping as follows: "Dependent activities should keep only minimal records necessary to provide a current status of funds pending receipt from the fiscal office of periodic reports on the official records maintained by the AAA" [Ref. 21, p. 8]. The particular activity designated to keep the "official" books is of little consequence to the PWO. The fact that they are not kept by the local comptroller is significant, however, since this eliminates the flexibility inherent in local maintenance.

4. Real Property Accounting

The comptroller or fiscal officer is responsible for accounting for Navy plant property at the activity. Specifically, "Fiscal Officers of the accountalbe activities . . . have the responsiblity for establishing and maintaining the official financial plant property records of assigned activities and for submitting the required financial reports" [Ref. 5, p. 6-4, 6-5]. However, the NAVCOMPT Manual further states, "Due to the nature of the data involved and the work required, the public works department is the department best qualified to perform the continuing review of real property records" [Ref. 5, p, 6-44].

While the NAVCOMPT Manual splits the responsibility for real property accounting and control at the activity level between the PWO and comptroller, the requirement for the recording of fiscal and financial data with respect to real property is well defined. Title 10, U. S. Code 2701 (a) requires that the Secretary of Defense cause records of fixed property to be maintained [Ref. 5, p. 6-3]. This requirement is implemented by a series of Navy publications that specify detailed procedures for the various Navy activities to follow.

C. NAVY ACCOUNTING

1. General

Since we are dealing with the public sector, accounting must serve a broader purpose than the managerial control required by the private sector. As Smith states, "In the broadest sense

accountability is the central objective of democratic government: how can control be exercised over those to whom power is delegated?" [Ref. 40, p. 26], and further, "lack of clarity on central objectives is often combined with efforts to overcontrol in detail" [Ref. 40, p. 32]. Thus, what may appear to the lower level manager as a needless compilation of data may in fact be needed in order to satisfy the requirements of public accountability.

The primary Navy accounting system uses functional accounts, each assigned a five digit number, for classifying transactions. The functional accounts cover all areas of Navy involvement and postings to these accounts are on an obligation and expenditure basis. The functional accounts provide details on what various appropriations received by the Navy are used for. Functional accounts include both capitalized and non-capitalized transactions. There are nine major series of accounts each further broken down by purpose or type of expenditure. The 40000 series of accounts covers ashore Naval activities and it is in this series that public works expenditures are reported [Ref. 4, Chap. 4]. With the advent of the Resource Management Systems (RMS) the functional accounts are seldom seen by the PWO.

A second form of accounting requires accumulation of costs by cost accounts which are summarized into functional categories. This is the RMS system used with the O&MN appropriation. The RMS system only accounts for expense; no capitalized items are included. This system will be described more fully in the next section. It is the primary system with which the PWO is involved and requires more detailed explanation.

2. Cost Accounting

a. General

To begin this section on cost accounting, it must be understood that the costs referred to are expenses. The present Navy shore activity cost accounting system was implemented on 1 July 1968 [Ref. 3, p. 1-3] and represented a major policy shift. The system is generally called Resource Management Systems (RMS). Previous to implementation of RMS shore activity financial management was aimed at accounting for obligations and expenditures of funds provided to activities through various allotments. RMS relates financing of an activity to the total cost of the assigned mission or task and recognizes costs (expenses) and records them against the budget at the time they are incurred not when they are ordered or paid. The system centralizes the funds previously provided to an activity CO by various allotments into one operating budget rather than allotment. The system also provides a uniform basis for budgeting and expense measurement and reporting [Ref. 3, Chap. 1].

b. The Operating Budget System

RMS as applied to Navy shore activities will be called the Operating Budget System (OBS) throughout the remainder of this thesis. Appendix A provides definitions for key OBS terms.

The OBS is designed to provide flexibility through all levels below the major claimant. Significantly, Operating Budgets (OB) and Operating Targets (OPTAR) are subject only to

administrative control. The statutory control and commensurate penalties of 10 USC 3679 R. S. are not applicable. In addition the OB is automatically increased any time a funded reimbursable request is accepted [Ref. 3, p. 1-8].

The system is designed to accumulate expense and work unit utilization by cost account. The cost accounts and the rules for their use are contained in the NAVCOMPT Manual; significantly the manual states, "Except for specific requirements . . . the level of detail expense and work unit data to be accumulated by the cost accounts will be determined by the allotment/operating budget grantor" [Ref. 4, p. 4-241]. Thus major claimants are given considerable latitude in specifying levels of detail required. At the end of each fiscal period the cost accounts are closed to ledger accounts listed in NAVSO P-3006 [Ref. 3].

For reporting purposes cost accounts are grouped into functional/subfunctional categories to provide a more meaningful display of data. Additionally to satisfy other reporting requirements, all costs posted to cost accounts must also be posted to elements of expense and reported in that manner. The NAVCOMPT Manual [Ref. 4, Chap. 4] provides considerable detail on just what costs go to what accounts and what accounts go to what functional/subfunctional categories and elements of expense.

The next element of the system that must be considered is the input control device, the job order. Very small activities are permitted to use the simple functional account number in lieu of a job order system, however most activities use the job order

method of accumulating expense data [Ref. 4, Chap. 4]. The job order system is designed to allow collection of information in a form useful to local management and to allow summarization of information for higher levels in the chain of command.

In discussing the job order NAVSO P-3006 states:

> Activities accounting for operating budgets will develop a job order structure to provide for the accumulation of accrued costs. The term 'job order structure' will include any assignment of codes for the purpose of accumulating and posting accounting information. A Navy-wide job order structure is not prescribed because of the variation in requirements . . . In addition the job order structure must provide details at any level desired by local management.
>
> [Ref. 3, p. 4-7]

This latter statement is particularly significant. Local management must decide to what level of detail to accumulate costs. From the PWO's standpoint as a manager, the more detail that the system will provide, the more flexibility he will have in sorting the data for various uses. However, from the comptroller's standpoint more detail means more job orders and, thus, more work and more chance for error in posting. Therefore, each year when job orders are developed, it is incumbent upon the PWO to realistically ascertain the level of breakdown he requires and do his best to convince the comptroller to generate the necessary job orders. Once the job order handbook is published and the fiscal year begins, it is too late to redistribute costs to additional job orders. An adequate system must be installed at the beginning.

c. Reports

The OBS provides reporting as follows:

> The system is designed to provide the cost center manager and responsibility center manager reports of financial and quantitative information which will enable him to expeditiously determine variances, areas where work load is increasing or decreasing, reduced or increased efficiency and to take corrective action to effect efficient utilization of available resources. The system also furnishes managers at higher echelons that information necessary for financial control in the broader spectrum . . .
>
> [Ref. 3, p. 2-3]

The primary report in the system is the Operating Budget/Expense Report - Detail, NAVCOMPT Form 2168. This report provides information on a monthly frequency as to work units completed, accrued expenses, cumulative to date by responsibility center and separately for each cost center. The information is sorted by cost center and functional/subfunctional category at both levels. (All reports discussed in this section are explained in detail in NAVSO P-3006 [Ref. 3].)

A second output report is the performance statement, NAVCOMPT Form 2169, again providing information at both the cost center and responsibility center level. This report is designed to compare on a monthly basis actual year to date expenses and work units with the planned figures from the budget.

A third report in the system is the Expense Operating Budget Financial Report, NAVCOMPT Form 2170. It is designed to provide current status of the OB to the OB grantor, normally the major claimant and is, therefore, not of significance to the PWO.

A fourth report is the Budget Classification/ Functional Category/Expense Element Report, NAVCOMPT Form 2171. This report is also designed to provide information to the major claimant and is not of consequence to the PWO.

A fifth report is the Military Service Report, NAVCOMPT Form 2182. This report provides information on military labor expense and again is not of concern to the PWO.

The above reports are all that the system requires to be generated. However, additional reporting to meet local needs is encouraged if the resources are available [Ref. 3, p. 6-49].

d. Cost Accounting Applied to Public Works

The OBS with respect to its specific application to public works is designed to accomplish the following:

> The data collected and reported under the cost control system will be used not only to inform management of the maintenance and operation costs of public works programs, but also to evaluate labor performance, to detect sources and causes of material waste, and to determine the effectiveness of continuous inspection.
>
> [Ref. 5, p. 7-7]

While the system is essential to the PWO in his management decisions, it also provides the information necessary at higher levels in the chain of command in developing major claimant and service wide statistics and reports. The cost accounting system is the only comprehensive standardized system for comparing public works performance against budget. Since we are dealing in the public sector, however, only inputs are readily measured and the system cannot appropriately be used to measure output oriented performance. This is the dilemma of public sector

evaluation, there is no defined output product whose total cost can be compared with its revenue derived in the market place [Ref. 39]. The customers of a PWO are not free to choose among competing sellers and, therefore, there is no measure of the utility of public works services, only measures of the inputs that developed these services.

The system is designed to accumulate costs of direct and indirect labor and material by job order or equipment code for transportation equipment. Costs included will be both funded and statistical. Statistical costs are those such as military labor that are funded from an appropriation separate from the one that funds the activity's operation and maintenance.

There are basically three input documents to the system: the time card, the material requisition and the work request. The time card, Labor Job Time Card (NAVDOCKS Form 1950, 1955 or 1961) or Bi-weekly Time Card (NAVCOMPT Form 9110) provides for an accounting of all public works civilian employees' time spent on or off the job during the working hours. The material requisition, DOD Single Line Item Release/Receipt Document (DD Form 1348-1) or Order for Supplies or Services/Request for Quotations (DD Form 1151), provides information on all material and contractual material or service used. Finally the various work requests, Work Request (NAVCOMPT Form 140), Project Order (NAVCOMPT Form 2053), Work Request (Controlled Maintenance) (NAVFAC Form 9-11014/20) and Shop Repair Order (NAVFAC Form

9-11200/3A), provide the information on how the funds are expended or provide funds from sources other than the normal appropriation (customer work).

Once the costs are input they become part of the standard OBS. The PWD is a cost center within the responsibility center. Although there are additional reports generated in the public works area beyond those listed above, these will be discussed at a later time with their particular public works subsystem.

3. Real Property Accounting

In recent years the Naval Facilities Engineering Command (NAVFAC) has established the Navy Facility Assets (NFA) Data Base in an attempt to provide one source for all information on Class I (land) and Class II (improvements) plant property. The NFA Data Base supports the Congressionally imposed real property inventory (RPI) requirement, the shore facilities planning system and provides information in support of the budget for real property maintenance [Ref. 26, p. 1]. While the NFA Data Base does not automatically provide all the reports necessary to satisfy the RPI requirement, it is of much assistance to the comptroller in meeting this requirement.

The NFA Data Base is designed to allow computerized updating by the activity quarterly, provided any Class I or II property is acquired, improved, outgranted or disposed. As presently configured the Data Base is maintained by the Naval Facilities Engineering Command Facilities Systems Office (FACSO)

in Port Hueneme, California. The system contains approximately 75 data elements, all or some of which may be used to describe each individual unit of Class I or II property. The data elements include such things as record number, size, location, use and maintenance requirement [Ref. 26, p. 3-1 to 3-3]. Although there are several input and output reports defined in the system to allow updating, verification and cost reconciliation with NAVCOMPT reports, the report of most interest to the PWO is the Property Record (PR). This record provides in one location a complete description of the individual unit of property. It provides for the PWO a listing of his inventory of Class I and II property that is readily available, uniform and reasonably easy to update. With the addition of maintenance funding data in late FY 74, the inventory also shows the source of maintenance funding [Ref. 26, p. 2-24].

The NFA Data Base is new and evolving. As it is further improved and expanded, it should become of increasing value to the PWO. This data base could be utilized for such things as computer generation of controlled maintenance inspection schedules, monitoring boiler inspection requirements and scheduling yearly facility maintenance programs. Once the NFA Data Base is fully implemented, it should provide the data base for numerous other computer generated reports and schedules to assist local managers in their day to day decisions.

D. BUDGETING

A previous chapter discussed the funds flow down to the activity level and the requirement for activity budget submission back up the chain of command. This section relates to the actual preparation of a station budget required by the OBS system.

One of the merits of the system is that budgeting and cost accumulation are accomplished in the same terms. Since the station budget is prepared for the major claimant, he will establish guidelines as to format. While the formats are generally specified in NAVSO P-3006 [Ref. 3], differences do exist. Of particular significance under the OBS is that budgets are documented in the same general format as the expense reports; namely by responsibility center and cost center to the functional/subfunctional category and cost account level. The Operating Budget/Expense Report, NAVCOMPT Form 2168, is the primary budget document [Ref. 3, Ref. 32]. Thus comparison of actual progress against the planned budget is facilitated.

Generally budgets are due at the major claimant in late spring. Previous to this summary targets have been submitted to the activity by the major claimant. At the activity these targets or annual planning figures (APF) are broken down and spread to the various cost accounts. The APF provides a target to the activity that cannot normally be exceeded in the budget submission without detailed justification [Ref. 33].

While the APF may specify required minimum expenditures in the public works area (the maintenance floor concept), decision

making as to where additional resources are expended is done at the station level. Thus the PWO is in competition with other departments for scarce resources and it is incumbent on him to have prepared a detailed plan for utilization of resources with sufficient justification as to why the resources are required so that he is adequately prepared to negotiate his needs during station budget meetings.

Prior to preparation of his department's budget, however, the PWO must determine the CO's priorities in the public works area. In today's austere funding environment there is never enough money for everything, so priorities must be established. This problem of discovering the CO's desires is not unique to budgeting; the point will be raised again in this thesis for it is one of the PWO's more serious concerns.

As a final comment on the budget, it is not static. In fact, soon after it is prepared and the yearly allocation of funds is made to the station, the budget will normally have to be updated. Invariably the allocation does not match the APF that the budget is based on. If the budget was properly constructed and priorities determined, however, updating should present no significant problem. As the fiscal year progresses the budget will require update as priorities change, funding changes or mission changes. At times it may need update because of invalid assumptions or mistakes in its preparation. The point is that the budget is a dynamic tool for use by the PWO in his day to day decisions.

IV. PUBLIC WORKS MANAGEMENT BY SUBSYSTEM

A. GENERAL

The principal tools of planning and controlling resource utilization are the establishment of standards and use of budgets [Ref. 11, p. 123]. Standards represent what quantity/quality of resource should be utilized on a certain operation while budgets represent constraints and/or plans for the expenditure of resources. The Maintenance Management, Transportation Management, Utilities Management, Housing Management and Shore Facilities Planning Subsystems described herein are based on the use of standards and budgets as planning and controlling tools in the attainment of subsystem objectives. The employment of the concept of standards allows highlighting variances, which are the difference between actual resources expended and the planned or standard resource expenditure. Variances permit top management to more effectively utilize time on other areas than the execution phase of the department's operation, employing the concept of management by exception. Thus in the accomplishment of work, management needs to correct only those conditions which are not as they should be [Ref. 11, p. 136].

Each of the operating subsystems (maintenance, utilities, transportation and housing) works in essentially the same manner, by first establishing engineered standards and then comparing execution against those standards to develop variances. Each has well defined operating procedures and each generates several

management reports. The management reports are designed to measure the efficiency of the utilization of resources both in dollar and man-hour terms. They do not, however, provide any measure of the utility of the output product generated by the particular subsystem.

To illustrate the objectives, functions and reports of one of the public works operating subsystems, the following discussion of the Maintenance Management Subsystem is presented. This subsystem was chosen since it consumes the majority of the PWO's discretionary resources and, therefore, requires the most thorough resource allocation planning on his part.

Since both the Housing Management and Shore Facilities Planning Subsystems have considerably different objectives and outputs than the other subsystems, both are individually considered following the discussion of the Maintenance Management Subsystem.

B. MAINTENANCE MANAGEMENT SUBSYSTEM

1. Objectives

The primary objectives of the Maintenance Management Subsystem are to provide to the PWO a management model that will allow him to efficiently utilize scarce resources and to meet command objectives and activity mission requirements in the areas of facility and equipment maintenance. The system provides the means to measure and monitor the quantities consumed and to efficiently utilize scarce resources. Thus the primary objectives are supported by [Ref. 25, p. 7]:

a. increasing the productivity of the maintenance workforce.

b. controlling and coordinating the workload and workforce.

c. providing means of directing the effort of the workforce to some set departmental objectives.

d. achieving cost reductions in the maintenance of facilities.

e. allowing for selectivity between alternatives.

2. Subsystem Operation

Work identification is the initial step in the subsystem operation and through this step facility and equipment deficiencies are identified. This identification process is accomplished through a continuous inspection program in which PWD inspection personnel on a regularly scheduled basis perform maintenance deficiency inspections [Ref. 25, p. 31]. Deficiencies are identified against a predetermined level of maintenance standard for each facility and item of equipment. Additional maintenance deficiencies are identified by personnel outside the PWD inspection organization and are brought to the department's attention through requests for maintenance service by other departments in the station organization and through official inspection reports of the command and others outside of the command.

Once maintenance deficiencies are identified, they move into the work planning and estimating phase. The deficiencies are planned and estimated utilizing material and engineered performance standards, where developed, to determine material,

labor, time and dollar estimates. These estimates then become the standard against which performance is evaluated [Ref. 25, p. 24].

The work scheduling phase, as the name implies, deals with scheduling individual job orders for actual work accomplishment. It is in this phase that the individual jobs compete with each other for accomplishment since the magnitude of maintenance deficiencies normally exceeds the resources available to correct these deficiencies. Thus, a backlog of work (jobs) is created. It is out of this backlog that jobs are selected and scheduled for the shops division accomplishment on a monthly basis. The plan, in essence, sets the workload goals for a particular month. At the shops division level each job scheduled for the month is further scheduled daily for accomplishment by a master scheduler. Actual efforts expended against each job are displayed daily on a Master Schedule Board.

Execution of work is accomplished by the various work centers within the Maintenance Division in accordance with the schedule developed by the Master Scheduler and work center supervisors. Expenditure of resources against each job is reported daily by use of a time card and later summarized in various management reports.

3. Reports

There are five primary management information reports generated by the Maintenance Management Subsystem which function to assist management at the activity level to control and measure

the effectiveness of the Maintenance and Utilities Division of the PWD. Three of these reports are internal to the activity and two are distributed to higher command external to the activity.

The Tabulated Report A, Feeder Report for Labor Control Report is required at all activities with 75 personnel or more in the Maintenance and Utility Divisions of the PWD [Ref. 5, p. 7-93]. This report, prepared by the activity's comptroller, accumulates man hours expended during the month and fiscal year to date by personnel in the Maintenance and Utilities Divisions. Data contained in this report is utilized in compiling the Maintenance and Utilities Labor Control Report (NAVFAC Form 9-11014/29).

The Maintenance and Utilities Labor Control Report is prepared monthly by the PWD utilizing the data from the Tab A report. The report displays and compares actual labor expended for each of the trade branches in the Maintenance and Utilities Divisions against the planned expenditures for the month as developed by the Maintenance Control Division (MCD). Additional information displayed shows indirect and overhead man hours and direct man hours with ratios regarding branch efforts during the month and year to date.

A third report, Tabulated Report B, Completed Job Orders, is prepared by the activity comptroller on a monthly basis. This report, as its title implies, compiles and displays data concerning individual specific job orders completed during the month. Information included in the report shows by work center

the actual versus the planned expenditure of resources (material, labor and dollars) consumed on each job order [Ref. 25, p. 97]. Analysis of this report provides management with variance information on the individual job.

The final management report prepared by the activity comptroller is the activity Operating Budget/Expense Report (NAVCOMPT Form 2168) [Ref. 32, p. 12-18]. This report, produced monthly, displays information regarding expenditure of resources by Functional/Subfunctional Categories and Cost Accounts. Management analysis of this report allows for the determination of variances between budgeted expenditures and actual expenditures for maintenance in various facility categories.

The last report covered in this section is an annual report compiled and produced by the PWD as a result of the Continuous Inspection Program. This report, the Type A Annual Inspection Summary (NAVFAC 9-11014/62), is submitted to NAVFAC and it identifies all facilities maintenance deficiencies that are unfunded at a particular activity in dollar terms. In essence, this report reflects the maintenance condition of facilities at a particular activity at a specific period in time [Ref. 24, p. 5-5].

C. HOUSING MANAGEMENT SUBSYSTEM

Housing operations and maintenance funds are provided as part of the military construction legislation by the Congress. The appropriation is for all DOD housing rather than by service as are other operations and maintenance funds. The operations and

maintenance funds provide for utilities, maintenance service, administration and leasing of family quarters. The RMS system does not apply to housing management. In terms of management and control, housing management is centrally directed by DOD, rather than by the Navy. Navy actions in housing management are co-ordinated by NAVFAC rather than by the major claimant as is the case with other operation and maintenance programs [Ref. 23].

Thus housing management is really a separate system attached to the public works department that includes a different budgeting, funding and control structure from the other subsystems. The reader should understand that housing management is a significant task, that has been administratively assigned to public works [Ref. 27, p. 12], and requires considerable management effort at the local level.

D. SHORE FACILITIES PLANNING SUBSYSTEM

1. Objectives

The objective of the Shore Facilities Planning (SFP) Subsystem is to improve forecasting, and increase the understanding of military real property requirements [Ref. 35, p. 2]. The subsystem provides a standard procedure for long range planning of facility additions, deletions and modifications.

2. Subsystem Operation

In concept the SPF subsystem described herein is relatively simple. Requirements are first defined and then compared with existing assets. Any deficiencies in assets are noted and action

is taken to request additional assets through the Military Construction (MILCON) Program. In reality the system is not quite that simple, primarily because of the difficulty in developing meaningful space requirements data in units of measure that can be readily translated to facility requirements [Ref. 32, p. 4-14].

The initial phase of the SFP Subsystem is the workload development using the Logistic Support Requirements (LSR) System as the vehicle [Ref. 34]. The LSR system is designed to determine activity workload in terms of mission, tasks, staffing and equipment requirements for a future eight year period.

Once workload data has been determined using the LSR System, this data is entered into the Navy's Shore Installation and Facilities Planning System (SIFPPS) [Ref. 35]. The LSR data is first translated into facility requirements data using NAVFAC P-80 [Ref. 22]. Once translated, the Basic Facilities Requirements List (BFRL), OPNAV Form 11000-1, can be developed. This list identifies all facility requirements for a station based on the LSR workload analysis [Ref. 29]. The BFRL can be compared with existing assets and then provision made for disposing of excess assets or programming new facilities, all of which follow routine defined procedures which need not be further considered. The significant factor is that the future requirements identification, which is a catalyst for the whole SFP Subsystem, is an individual activity function [Ref. 35, p. 4].

3. Organizational Components

Organizationally the detailed operation of the SFP Subsystem is normally delegated to the PWD [Ref. 32, Chap. 2]. However, since it involves thorough analysis of workload criteria of all components of an activity, the SFP Subsystem should logically have inputs from other departments. Like the station's budget that is prepared by the comptroller after integrating the needs of the entire station, the SFP documents may be prepared by the PWD, but should reflect integrated station-wide considerations.

V. PWO MANAGERIAL FUNCTIONAL ANALYSIS

A. INTRODUCTION

The three most common functions of a manager generally recognized in management literature are planning, organizing and controlling [Ref. 9, p. viii]. This chapter analyzes the PWO's management responsibilities in each of these three functional areas.

B. PLANNING FUNCTION

1. General

Within the field of management, planning is generally recognized as the primary and fundamental managerial activity of higher level managers [Ref. 9, p. 57]. It would logically follow that planning must receive the PWO's major emphasis since he is the senior manager within the Public Works Department.

As indicated by Donnelly, et al, "the planning function includes all the managerial activities which lead to the definition of goals and the determination of appropriate means to achieve these goals" [Ref. 9, p. 57].

The planning function of the PWO is not to be confused with the planning included within the public works management subsystems, but rather with the planning necessary for the establishment of overall departmental goals. In order for the PWO to properly manage his department, it is mandatory that he establish goals which the department seeks to accomplish. Failure to accomplish this task will, as indicated by Donnelly, result in an organization which is an aimless entity [Ref. 9, p. 58].

2. Goal Setting

Goal setting in the Public Works Officer's environment must be a participative effort between the PWO and the activity Commanding Officer, for it is the activity's overall goals which the PWO must support [Ref. 9, p. 59]. Therefore, the PWO's goals must be a combination of subgoals for his department which support the goals of the activity Commanding Officer. These goals must integrate with the subgoals of the other departments within the activity's organization and sum horizontally across the organization to support the overall CO's goals.

In the private sector of the economy, George W. England found that the goals of profit and related efficiency and productivity were ranked highest in goal priority by management.

[Ref. 10, p. 107-117]. In the public sector, the establishment of profit goals is not applicable. As a counterpart goal, however, the mission of the shore activity should be the primary driving goal of the activity's managers. Indeed a review of many military documents and regulations, including Navy Regulations, continually refer to the "performance of the military mission" as the objective (goal) of all naval managers [Ref. 8, p. 1]. With this in mind then, it is necessary for the PWO to fully understand the mission of his activity and the support functions his department contributes to that mission; in other words, departmental goals.

A review of existing technical public works management publications and attendance at the Civil Engineer Corps Officer's School (CECOS) course for public works management was conducted. The results of this investigation failed to uncover any significant management tools or methods which pertained to helping the PWO set departmental goals, either short or long range.

3. Budgeting

With the establishment of departmental goals, budgeting becomes one of the major duties of the PWO for it is budgeting which operationalizes the department's goals [Ref. 9, p. 69]. As the senior management official in the department, the PWO must make the crucial decisions on what specific work is to be accomplished.

In the military budgeting process, normally the activity will receive an APF early in the budget cycle. The APF at the station activity level is then usually redistributed to the various department heads by the activity Comptroller. It is this figure which acts as the initial constraint to the PWO in the accomplishment of his workload. At this point, the PWO will begin the compilation of his departmental budget submission.

The budget submission will reflect in dollar resources that portion of the workload that the PWO plans to accomplish in the coming fiscal year. Additionally, it will document that portion which cannot be accomplished because of the APF limitation.

4. Policy Implementation

Policy implementation is the final subfunctional step in the planning process [Ref. 9, p. 57]. It is through this process that the PWO will communicate and set the goals of the department internally. These policies must be statements which reflect the basic goals of the department and which provide the guidelines for carrying out action throughout the department, as indicated by Hegginson [Ref. 17].

5. Factors Influencing the PWO's Goals

As would be expected, many factors are present in the PWO's environment which influence and at times constrain his freedom in the management of the PWD. Obvious factors are the PWD organization (discussed later), technical standards and various rules and regulations which govern the nature of his environment. Most of these factors are described in detail in

various instructions, regulations, and publications and, therefore, will not be discussed in this thesis. Research of these documents has revealed that little information or discussion has been published regarding what the authors will term "personal factors" that effect and influence the PWO in the management process. These "personal factors" need to be understood by the PWO in order for him to manage more effectively. The factors include PWO performance evaluation, effectiveness versus efficiency, professionalism, and NAVFAC-activity CO potential conflicts. These factors are a driving influence on the PWO in his day to day management process.

One of the environmental factors influencing the PWO is the subject of performance evaluation of the PWO by his superior (CO). It is well understood in the Navy that the performance evaluation (Fitness Report) is the determining factor in the areas of career longevity and promotion for a naval officer. Logically, the PWO desires to obtain and strives for the highest rating possible. This rating is assigned by the CO based on the individual CO's concept of how well he believes the PWO has performed.

What determines the parameters by which the CO evaluates his PWO? It is the degree of effectiveness exhibited by the PWO in meeting the CO's goals. It is necessary for the authors to define two key words, efficiency and effectiveness, for these words play an important role in the evaluation process. In the subsequent usage of these words, efficiency will be

defined as meaning the degree of variance between actual and standard expenditures of resources. Effectiveness will be defined as meeting command's goals and missions (not necessarily in an efficient manner).

The Appraisal Work Sheet, which is the feeder report to the Fitness Report, continually references the word effectiveness in the rating blocks of the form and relates effectiveness in terms of contributions to the activity's mission [Ref. 1]. The form does not measure the efficiency with which the PWO is performaing his management responsibilities. Therefore the CO, using the Appraisal Work Sheet, is evaluating the PWO on how effective the PWO is in meeting the goals that the CO deems necessary of the PWD. This infers that the PWO must identify those goals and tailor the management of the PWD in such a manner as to meet them in order to be an effective performer in the CO's eyes. It is in this manner that the performance evaluation acts as an influence on the PWO.

The second factor influencing a PWO's management process is one of professionalism and it can work against the goals of the organization. Grean states, "the goals that a professional tries to reach through his organizational employment usually diverge from the organization's own goals" [Ref. 13, p. 13]. Further studies by Taylor indicate that, "engineers tend to look down upon organization managers as men of inferior knowledge who reduce the importance of the engineers judgement" [Ref. 13, p. 18]. The CEC officer, as a professional engineer, possesses

the potential of establishing what he considers good goals professionally for the PWD in lieu of CO goal expectations.

Another influencing factor on the PWO is his professional tie, as a Civil Engineer Corps Officer, to NAVFAC. NAVFAC acting in the role of CNO's technical expert on public works, has designed a very rigid public works management process. As this thesis has already documented, the system is tradition-bound and very inflexible. However, the PWO must use it in his management process. The significant feature of the whole NAVFAC developed system is that it measures the PWO's performance in terms of efficiency and not how effective his performance is in meeting his CO's goals. This provides a dichotomy for the PWO, who as both a CEC officer and a member of his CO's staff, is evaluated by two masters who use different performance measures. His professional peers and seniors view his performance from an efficiency standpoint, while his immediate CO views his performance from an effectiveness standpoint.

C. ORGANIZING FUNCTION

1. PWO's Role in Organizing

The PWO is normally the senior CEC officer at an activity and the head of a department whose technical operation is unfamiliar or perhaps even unknown to the activity CO. It would appear logical that the CO trust to his PWO, as the public works expert, the job of organizing the PWD. The PWO, however, even with the CO's concurrence is not entirely free to organize his department at will. Two significant constraints exist.

The first constraint on the PWD organization is generated by the cost accounting system. The NAVCOMPT Manual provides that its procedures are mandatory for all Navy activities [Ref. 5, p. 7-3]. The Comptroller of the Navy (NAVCOMPT), in specifying a standard cost accounting system, has constrained the PWD to the extent that it must be so organized as to be able to furnish the required expense data. Specifically, separate planning and execution organizations must be developed to allow monitoring actual performance against standard performance.

A second major constraint is imposed by the standard public works management systems developed by NAVFAC. The Secretary of the Navy has directed NAVFAC to develop and promulgate operational guides for public works systems whose use is mandatory by all shore activities [Ref. 25, p. 1]. These systems combine the expense accumulation procedures required by NAVCOMPT with resource consumption data accumulation to provide public works management with specific efficiency measures. Although these systems are rigorously defined in various NAVFAC publications, they do permit minor local deviations [Refs. 22, 23, 25 and 27].

Although the PWO may not have the flexibility to totally organize his department to his standards, he does have considerable freedom in assigning duties to his subordinate military personnel. For example NAVFAC P-318 in describing the organization of a PWD says only that the APWO is "responsible to the Public Works Office (sic) for the day to day operations and

overall coordination of the several organizational components of his department" [Ref. 27, p. 12].

Two well known principles of management theory are that subordinates must have well defined jobs with sufficient challenge and reward to satisfy individual psychological needs and that a manager is responsible for training his subordinates to attain higher levels in the organization [Ref. 9]. Thus, it is incumbent on the PWO to insure that his APWO learns both the principles of public works management and has a job sufficient to satisfy the APWO's own needs.

2. Effects of the Public Works Organization

Although the PWO is required to utilize a standard organization, as its senior manager he should understand what effects that organization has on the employees of the PWD.

No matter how well developed production control procedures are, variances from standard will exist. This fact has been recognized by both social scientists [Ref. 14] and industrial engineers [Ref. 44]. Its significance to the PWO is that the PWD operating subsystems can never achieve optimality in efficiency terms and, therefore, management should not attempt to drive employees toward showing zero variance on the various management reports when variances do truly exist. In fact the PWO should take just the opposite tack and encourage disclosure of variances so that by their analysis improvements can be achieved.

Social scientists today lean toward the belief that most people are not fixed entities, incapable of change, but rather that they are both capable of adaptation and desire to make a higher level of contribution to the organization than the organization normally permits [Ref. 12]. In essence this says that McGregor's Theory X [Ref. 9, p. 422] has less credibility today than does his Theory Y. Since the public works organization establishes detailed, comprehensive controls on the workers' initiative and performance (the concept of Theory X), the PWO should realize that he might be able to achieve better results simply by encouraging his workers to show greater initiative.

The PWD, while it may be relatively small itself, is part of a gigantic organization, the U. S. Navy. The massiveness of the organization creates a certain behavior pattern described by Presthus as follows:

> Organizational logic is essentially conservative, for it honors consistency, tradition, and minimizing of individual ends in favor of collective ends, and the wisdom of history rather than the wisdom of men. A resulting major quality and dysfunction of big organizations is, therefore, their inflexibility in the face of social and technological pressures for change. They resist conflict and creativity because they tend to assume that what is, is good.
>
> [Ref. 37, p. 29]

To the PWO this inflexibility means that his department will probably be slow in reacting to technological change and that he, as a manager, must constantly strive to instill in his subordinates the need to remain current with technological advances in the industry.

Another factor related to that discussed above is that although large bureaucratic type organizations are slow to change, their behavior is predictable and relatively constant. In other words, there is very little uncertainty connected with the outcomes of bureaucratic actions [Ref. 15]. The significance of this to the PWO is that the day to day operation of the PWD will continue with or without his specific direction. Although he may assume that he is in charge and in control, unless he actively sets a course for his department, the course will be set by the organization itself. The day to day functions will continue with little interruption, but without good comprehensive, overall planning and firm direction, the organization's goals vice the manager's will tend to dominate. It is conceivable that even though the PWD was operating in a highly efficient manner, it could be moving toward goals alien to those of top management.

Even though the PWD organization is rigorously defined on paper, there will be informal groups interacting at various levels. Most social scientists recognize the existence of informal groups [Ref. 9, p. 168-169] as a factor influencing the output of the organization. Van Zelst's experiments, allowing construction workers to select their own work groups, demonstrated that output can be improved through management's acceptance of the existance of informal groups [Ref. 41]. While the PWO certainly cannot allow each worker to select his own work group as Van Zelst did, he must be cognizant of the

fact that the goals and ambitions of the various informal groups within the PWD may not be in congruence with his goals.

D. CONTROLLING FUNCTION

The control system used by the PWO consists of two elements. The first element is goal oriented effectiveness control and it is exercised through use of the monthly expense reports prepared by the comptroller. These reports allow the PWO to measure actual expenditure in various areas with his planned level of effort goals. The second element is production efficiency control which is exercised through use of the various public works management reports. These provide information on resource consumption efficiency and highlight variances. The reports used in the public works control system are well defined in various Navy publications. The CECOS Public Works Manual [Ref. 32], in particular, provides an excellent summary of all public works reports.

As was true with the organizing function, the PWO has little freedom in modifying the established control system. His primary discretion is in asking for additional reports beyond those provided by the standard system. If the PWO chooses to exercise this option, he must do so with care for too much information is one of the primary causes of failure of a control system. Management theory stresses that only information specifically required by a manager should be reported to him [Refs. 38, Chap. 19 and 18, Chap. 2].

The public works control system derives nearly all its information from two sources, employees' time cards and material requisitions, both of which are humanly prepared and subject to human error. If the employee, knowingly or unknowingly, lists the wrong job order number and labor class code on his time card, the wrong job and subsequently the wrong cost accounts will be charged with the expense of his time. Likewise, a material requisition listing the wrong job order number will cause the same problem. Thus, it is incumbent on the PWO, wherever he is able, to simplify input demands of the control system. Ideas, such as preprinting forms, shortening character strings the employee must remember and transfer, and data processing checks should be employed where possible. The human element is at work throughout the control system and just because the input documents are correct does not mean that other human errors will not occur in the process of report generation. For this reason output reports should be carefully analyzed before decisions are made based on unexpected results.

VI. CONCLUSIONS AND RECOMMENDATIONS

A. GENERAL

This chapter sets forth the major conclusions and recommendations of the authors with respect to the PWO and his management functions. Although several minor conclusions and inferences have been drawn in previous chapters, this chapter highlights the authors' major findings.

B. EFFECTIVENESS VERSUS EFFICIENCY

As discussed in the body of this thesis, the PWO is buffeted by many diverse information streams. In the authors' opinion the primary factor influencing the PWO's management process is the dichotomy between the CO's imposed effectiveness criteria and his own efficiency oriented engineering training and outlook. This dichotomy has been shown to be further strengthened by the efficiency orientation of the PWO's CEC mentors, NAVFAC and its EFD's. In the long run the PWO will have duties assigned by other CEC officers and the boards that review his performance for potential selection for promotion will be composed primarily of CEC officers. Thus, although the effectiveness oriented activity CO is his reporting senior while he is the PWO, that CO's fitness reports will eventually be used by efficiency minded CEC officers in determining the PWO's future.

The significance of this dilemma to the individual PWO is that he must decide in his own mind what goals his department will pursue and then attempt to achieve those goals while satisfying both effectiveness and efficiency constraints. The authors recommend the approach of meeting the CO's effectiveness criteria in the most efficient manner possible under the circumstances of the situation. Where the CO's criteria will lead to significant inefficiencies, the PWO should advise the CO and attempt to persuade him to relax his effectiveness criteria. However, in the long run it is the CO, not the PWO, who should determine how the station's resources are expended. All the PWO can do is attempt to advise and illustrate the benefits of efficiency.

C. PLANNING

A thorough review of management literature concerning the PWO's responsibilities as a manager leads the authors to conclude that long range planning is often not given the attention it deserves. The authors have already shown the significance of the need for planning. In view of this need and the lack of attention it gets, the authors recommend the following method to accomplish sound planning. This method will be discussed in relation to helping the PWO set goals for the maintenance subfunctional category of his department only; however, the same methodology can be utilized in the other subfunctional categories. The PWO should utilize a goal setting strategy which involves the CO and it is to this end that this method is directed. The method can be broken down into two phases: (1) inhouse goal plan development, and (2) CO presentation/review and approval.

The inhouse goal development begins with identifying the total maintenance workload confronting the public works department for the next year. The maintenance workload should include backlog of facility maintenance deficiencies as shown on the Annual Inspection Summary, standing repetitive maintenance work, and preventive maintenance workload. This workload identification should include all potential maintenance work required, unconstrained by expected funds allocation from the major claimant. With this data the PWO will have a good description from an engineering standpoint of the maintenance demands on his department in the coming year and the resource requirements

necessary for their accomplishment. Invariably, however, his resources will not be sufficient to correct all these deficiencies.

In order to effectively manage this maintenance workload, the maintenance requirements (manhours and dollars) should be aggregated by cost account codes and planning accomplishment of the requirements in each cost account code on a "level of effort percentage" basis. "Level of effort percentage" means assigning a percentage goal for resource allocation to each cost account in which resources will be expended. These level of effort goals should be ranked in priority order. Thus, no matter what funding is finally provided, a priority plan for allocation of maintenance effort would be available. For example, a ten percent target level of effort may be set for Bachelor Enlisted Quarters (BEQ) maintenance. Once the department's total resource allocation is stabilized, and finalized, ten percent of that resource would be targeted for expenditure against BEQ's in the coming fiscal year.

Employing the conceptual procedure presented above the PWO can develop a goal oriented level of effort plan for maintenance and other subfunctional categories. Once developed to the PWO's satisfaction, phase one of the goal setting is accomplished in regards to a departmental short range plan. This concept should be extended into a long range plan including a period of three to five years into the future. The requirement for a long range plan is necessary in order to avoid making short term decisions which may be highly effective in the short run but

disastrous in the long run. James L. Hayes, President of American Management Association, points this out by the following statement:

> Planning--especially long range planning--gets much lip service. But precious few people really believe in it or feel comfortable with it and that goes for industry as well as government. The overworked excuse that administrators come and go and must justify themselves quickly leads to emphasis on short-range planning, ignoring the fact that what may be highly productive short term can be disastrous long term.
>
> [Ref. 16, p. 10]

Phase two encompasses the PWO presenting his level of effort plan and the percentage goals developed to the activity CO. The presentation should include what the backlog of maintenance workload is currently, an explanation of the objectives of the long range plan, and a review of the short range departmental goals established to approach the long range objectives. Logically, this type of presentation will allow the CO to indicate what areas of effort are most important to him, thereby furnishing the PWO with additional guidance in the goals the CO expects of the PWD. Additional benefits realized from this strategy are that of a mutual understanding between the PWO and CO on what the PWD is trying to accomplish and the self-satisfying feeling given the CO in allowing for his inputs and participation.

Once the plan has been approved by the CO, the PWO has in effect established fairly specific goals for his department; ones that are not tied to resources but a level of effort in the consumption of future available resources. These specific goals can

be defined in terms of budget constraints when budget figures are received.

D. RESPONSIBILITY FOR THE OPERATING SUBSYSTEMS

The PWO should divorce himself from the day to day operation of the public works subsystems. He should be concerned with overall planning of goals and coordinating his department's progress toward those goals. In this respect he should be concerned with the management reports that show resource allocation information that he can compare with his planned allocation. He should be concerned primarily with the effectiveness of his organization in meeting its goals rather than the day to day efficiency of production. He cannot ignore long run efficiency, however, for the more efficient resources are consumed, the more resources are available for other uses.

The authors recommend that the PWO delegate to his APWO the responsibility and the requisite authority for the four public works operating subsystems: Maintenance, Transportation, Utilities and Housing Management. This responsibility should cover all areas from initial budgeting, through execution to variance analysis. This gives the APWO a well defined area in which to operate and exposure to the heart of public works operations. In addition through budgeting and variance analysis the APWO will interact with the financial management aspects of public works. The PWO should retain the overall responsibility for the PWD, but it is incumbent upon him to provide meaningful

duties to his subordinates and provide them the opportunity to train for future positions of greater responsibility. Providing the APWO the responsibility for the management of the day to day operations of the PWD in line with the PWO's stated goals should provide job enrichment to the APWO and allow the PWO to spend his time on other matters. By periodic review of the public works subsystem management reports, the PWO can monitor the APWO's progress and advise him of areas that need attention or correction. Thus, the APWO will be concerned with insuring that the department is operating in an efficient manner, once the PWO has established the overall objectives.

E. THE PWO AS AN INDIVIDUAL

A search of relevant literature relating to public works management has led the authors to conclude that there is little discussion of the role of the PWO as an individual manager. While there is much discussion of the PWD and how it should be managed, these discussions tend to imply that the PWO is the only manager in the department and makes all the decisions at all levels. The authors recommend that further study be conducted into the specific duties and decisions a PWO should personally accomplish vice delegate to a lower level manager.

The authors believe that such a study would show that the PWO should be deeply involved in financial management decisions. This opinion is supported by a survey of PWO's conducted by another CEC officer [Ref. 20]. It is the opinion of the authors

that this also is an area in which the prospective PWO receives little training. As part of the research for this thesis one of the authors attended the two week CECOS Public Works Course in an attempt to determine what pretraining the prospective PWO gets. Significantly, that course spends no time discussing the accounting system used for public works and only minimal time on public works budgeting [Ref. 31].

APPENDIX A

DEFINITIONS

Accrual accounting - accounting for operating costs in the fiscal period during which the benefits they derive are received [Ref. 3, p. 1-4].

Cost account - a four digit alphanumeric character string used to classify costs by the purpose of the transaction, for example: 1A10 - Command and Executive Offices [Ref. 4, p. 4-241].

Cost center - a subdivision of responsibility center (see below), for example: Public Works Department [Ref. 3, p. 1-5].

Element of expense - a one digit alphabetic character used to classify costs by the nature of the resource consumed in the activity, for example: A - Military Personnel [Ref. 32, p. 13-1].

Expense - the cost of goods or services consumed in the process of operations [Ref. 19, p. 57]. Under RMS expenses include civilian and military labor, supplies consumed, travel, equipment rental, equipment purchase (below $1,000 cost) and minor construction below $50,000 cost (O&MN funded only) [Ref. 3, p. 1-5, 1-6].

Functional category - an alphabetic character used to summarize expenses carried in cost accounts, for example: L - Base Operations [Ref. 4, p. 4-225].

Operating budget (OB) - annual budget provided by a major claimant to an activity (responsibility center) and subject only to administrative control [Ref. 3, p. 1-6].

Operating target (OPTAR) - authority to obligate money issued to a level below the responsibility center and subject only to administrative control [Ref. 3, p. 1-6].

Responsibility center - with minor exceptions, shore activities listed in the Standard Navy Distribution List [Ref. 3, p. 1-6].

Subfunctional category - a further breakdown of the functional category summarization, but at a higher level of summation than the cost account, for example: L7 - Transportation Operations.

Work unit - a unit of measurement, such as tonnage moved or students processed, used to quantify physical output [Ref. 3, p. 1-7].

GLOSSARY

AAA	Authorization Accounting Activity
APF	Annual Planning Figure
APWO	Assistant Public Works Officer
BFRL	Basic Facilities Requirements List
CEC	Civil Engineer Corps
CECOS	Civil Engineer Corps Officer's School
CNO	Chief of Naval Operations
CO	Commanding Officer
DOD	Department of Defense
EFD	Engineering Field Division
FACSO	Facilities Engineering Command Facilities System Office
LSR	Logistic Support Requirements
MCD	Maintenance Control Division
MILCON	Military Construction
NFA	Navy Facility Assets
NAVFAC	Naval Facilities Engineering Command
NAVCOMPT	Comptroller of the Navy
OB	Operating Budget
OBS	Operating Budget System
O&M,N	Operations and Maintenance, Navy
OPTAR	Operating Target
PR	Property Record
PWC	Public Works Center

PWD	Public Works Department
PWLA	Public Works Lead Activity
PWO	Public Works Officer
RMS	Resource Management Systems
RPI	Real Property Inventory
SECNAV	Secretary of the Navy
SFP	Shore Facilities Planning
SIFPPS	Shore Installation and Facilities Planning and Programming System

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